

THE RAND CORPORATION and OUR POLICY MAKERS

by Saul Friedman

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FOR nearly a generation the United States has labored through an age of warlike peace. Because of the possibility of thermonuclear annihilation, it is inevitable that the nation's leading thinkers, scientists, and scholars should be preoccupied, as never before, with the study of the weaponry, strategy, economics, psychology, and politics of conflict.

During World War II thousands of talented scientists and technicians came to industry and government to create the means to win the war. Their contributions were decisive, but rarely did the scientist or scholar take part in the making of military and political strategy. In 1945, at the height of the war which gave birth to the atom bomb, radar, and jet power, the federal government spent \$513 million for research and development of weapons. This year the federal government expects to spend more than \$7 billion on defense research and development and nearly \$4 billion more on atomic energy and space research. (In contrast, about \$1 billion will be spent on all other — peaceful — research paid for by government.) It is estimated by the National Science Foundation that the federal budget finances about 65 percent of the total national expenditure for research and development, and 92 percent of that money is invested in defense research. Since 1945 the budget for defense research has increased more than twentyfold, and it continues to rise.

Figures in the billions become blurred in the consciousness, but the comparisons serve to show

that research and development for defense have become a giant new industry. The scientist, the technologist, and the scholar have enlisted in the paramilitary, the branch of the nation's defense establishment which is neither military nor civilian but both, and which exerts astonishing influence. It gives rationality and intellectuality to foreign policy and military strategy and to possible wars, ranging from anti-guerrilla combat in the jungles of Southeast Asia to global thermonuclear holocaust.

The Department of Defense draws its paramilitary personnel from more than three hundred universities and nonprofit institutions in the nation. Universities have created — on and off the campus — centers and institutions to do research for defense. These university-associated research centers actively compete for consultation contracts with the Defense Department, the State Department, or the military services. If the special research center on the campus does not have a contract, then the individual member of the faculty who has become noted in his field consults with the government on the technological or the political problems of strategy. The *Boston Globe* reported recently that five thousand academics from the Cambridge area serve as consultants in Washington.

The single most influential research organization, however, is not directly associated with a university. The Rand Corporation of Santa Monica, California, is the oldest among more

than one hundred and fifty nonprofit organizations which have been created to do specialized strategic research. It is to the other research groups what West Point, Annapolis, and the Air Force Academy are to the army, navy, and air force. The Rand Corporation is the paramilitary academy of United States strategic thinking.

Achieving a remarkable degree of intradisciplinary research, the Rand Corporation does the basic thinking behind the weapons systems, the procurement policies, and the global strategy of the United States. Unlike any strategic research organization anywhere else in the world, the Rand Corporation has become internationally famous, and controversial, for bringing a new mode of thought to problems of cold war strategy. (The Soviets, incidentally, have called Rand "The Academy of Death and Destruction.") In bringing about his revolution of the Defense Department, Secretary Robert McNamara acknowledged his debt to the Rand approach by naming Rand researchers and supporters to top posts in his department.

ON NOVEMBER 7, 1944, a few months after D-day, General H. H. ("Hap") Arnold, head of the army air forces, issued a memorandum briefly recounting the important role research and development had played in the war, especially for the air forces, and expressing the need for the air force to retain organized brainpower after the war "to assist in avoiding future national peril and winning the next war." Officials of Rand (a contraction of the words "research and development") point to this memo as the origin of their organization.

In hearings last year before a House subcommittee on military operations, Rand President Franklin R. Collbohm recounted the early planning for what became Project Rand. In late 1945, Collbohm, assistant to Arthur Raymond, vice president of engineering for the Douglas Aircraft Company at Santa Monica, spoke to General Arnold about "ways in which we could save these scientific and industrial resources for the service of the Government. There was general agreement that there was no procurement agency in the Government existing at the time that was suitable for buying brains rather than bolts and nuts," Collbohm said, "and the discussion then was that a new high-level procurement agency that was really designed and staffed to buy brains would have to be set up. At that time it was recognized that it was not going to be suitable to use contract negotiation procedures that are typical of industrial negotiations."

In late 1945, without congressional approval

and without taking bids, General Arnold signed a contract with the Douglas Aircraft Company to create Project Rand. Air Force Regulation 20-9 gave it official status, and on March 9, 1946, General Curtis E. LeMay, who was to become commander of the Strategic Air Command, said that the objectives of Project Rand were to engage in "a program of study and research on the broad subject of intercontinental warfare other than surface, with the objective of recommending to the Army Air Forces preferred techniques and instrumentalities for this purpose." The contradictions that were later to cause severely strained relations between Rand and the air force were inherent in Regulation 20-9, which defined Project Rand as an agency to furnish information and "independent, objective advice" in order to "assist in the formulation and implementation of Air Force plans, policies and programs."

Douglas, the fifth-largest contractor during the war, cooperated fully to create Project Rand. Collbohm was placed in charge. Rand was given space at the Santa Monica plant. Douglas furnished accounting services and security guards, and Rand became a subsidiary division of the aircraft company. However, in search of autonomy, Collbohm said, Rand moved from the Douglas plant, when it was justified, to rented quarters in downtown Santa Monica, still retaining some of Douglas' services. Nevertheless, other aircraft companies were somewhat nervous about the relationship between Rand, the air force, and Douglas. So Collbohm decided to "alleviate that problem" by setting up a Rand Advisory Council, a most unusual move, since Rand was an air force project. Members of the council included Collbohm's former boss, Raymond, Douglas president Donald Douglas, and top executives from North American Aviation, Boeing Aircraft, and Northrop Corporation. The council, said Collbohm, "sat as a board over us, meeting regularly, knew what we were doing and so on."

By 1948 Rand set out for a wider range of thinkers. As Collbohm testified, "World War II weapons and concepts were rendered obsolete by advancing technology; the military, economic and political considerations have become indissolubly linked. Project Rand was formed out of the conviction by General Arnold that the Air Force should support this new effort to assist in its reaching decisions concerning air war of the future — decisions which must include economic and political, as well as scientific, engineering and military insights." To obtain men capable of such research, it was evident that Rand would have to abolish its rather thinly disguised association with the aircraft industry and seek autonomy also from the air force. "Actually," said Collbohm frankly, "we

thought that pretty well at the beginning but we did not publicize it. But it was obvious that if something like this [Rand] was expected to survive, it would have to be completely independent. Otherwise it would never be thought to be completely objective and unbiased, whether or not it was."

ENTER now the man who breathed the kind of life into Rand that made it the influence it is today. He was the late H. Rowan Gaither, Jr., a peripatetic San Francisco attorney and former chairman of the Ford Foundation who established a great reputation during World War II as a research and development administrator and logistics expert with the Radiation Laboratories of Massachusetts Institute of Technology. These were the laboratories at which the uses and applications of radar were developed. Gaither worked there with Karl Compton, then president of M.I.T., and Arthur Raymond of Douglas Aircraft Company.

In 1948, about the time Rand began casting about for aid in setting up an autonomous shop, Gaither had been asked by Compton to undertake a study of possible programs and policies of what was to become the Ford Foundation. This was known to Raymond and to L. J. Henderson, Jr., a Harvard-trained attorney and banker then at Rand who had worked with Gaither at the Radiation Laboratories. Henderson and Collbohm approached officials of the nascent Ford Foundation and received the promise of a loan of \$500,000, which later became an outright grant of \$1,000,000.

On May 14, 1948, with Collbohm, Henderson, and Gaither as the incorporators, California granted the Rand Corporation a charter "to further and promote scientific, educational and charitable purposes, all for the public welfare and security of the United States of America." Collbohm became president, Henderson was named vice president, and Gaither was elected the first chairman of the board of trustees. Rand was incorporated as a nonprofit, nonstock organization owned by the member-trustees. With the exception of officers like Collbohm and Henderson, members of the board were elected to five-year terms, not to exceed two consecutive terms. The board meets twice a year for two or three days to ratify general policies of Rand. The day-to-day research work and policy are under the guidance of the full-time administrators and eminent Rand scholars who are on the corporation's research council. Under the terms of its contract with the air force, Rand's work is subject to the formal approval of an advisory group of air force officers.

This became an impediment to independence as Rand research began to run counter to the purely military outlook of air force policies.

Once the Articles of Incorporation gave Rand *de jure*, if not *de facto*, autonomy from the air force and the aircraft industry, Rand's next job was to build its image and influence through an impressive new board of trustees. It included Dr. Lee A. DuBridge, a physicist, then president of California Institute of Technology; Charles Dollard, an educator, a former member of the General Staff Corps in World War II, and then president of the Carnegie Corporation; Philip M. Morse, a physicist who was director of Brookhaven National Laboratories; and J. A. Hutcheson, vice president and director of research for Westinghouse Electric.

The names of succeeding trustees indicate the evolution of Rand as a crucial research link in a chain which includes a powerful military service, educational institutions, and industries that are all heavily committed to a rather like-minded and single-minded view of this nation's role in the world. They therefore come naturally to the necessity of multibillion-dollar arms budgets. Rand has shown, to the occasional distaste of the air force, much remarkable objectivity and independence in its research, but rarely is it an objectivity which has *qualitatively* differed from the air force's view of the cold war, as Collbohm testified before Congress. "Whatever we take on," he said, "should mesh in with our ongoing program, which is primarily the Air Force program."

The present trustees include Mark W. Cresap, Jr., president of Westinghouse Electric Corporation; Don K. Price, Jr., dean of Harvard's Graduate School of Public Administration; David A. Shepard, executive vice president, Standard Oil Company (New Jersey); Kenneth S. Pitzer, president of Rice University; Charles A. Thomas, board chairman, Monsanto Chemical Company; J. A. Stratton, president of M.I.T.; William Webster, president of the New England Electric System; Edwin E. Huddleson, Jr., an attorney with Gaither's former law firm; William R. Hewlett, executive vice president and partner in Hewlett-Packard Company, an electronics firm; and Philip L. Graham, president of the Washington Post and Newsweek. Since Gaither's death in 1961, Frank Stanton, president of the Columbia Broadcasting System, has been chairman of the board.

EACH year since 1948 Rand has grown by 10 percent. In 1953, with an assist from the Ford Foundation and a mortgage, Rand left its rented offices and built, around six inner courtyards, a two-story, two-million-dollar, palm-studded build-

ing overlooking the Pacific Ocean. In 1961 Rand spent about \$4 million to put up an attached five-story building for more office space.

Rand makes most of its money by charging the air force 6 percent of the estimated cost of the contracts which the air force lets to private industry as a result of Rand's work. Rand, in recent years, has received relatively small grants and contracts from private foundations and other government agencies, and some money has come in from the publication of books written under Rand auspices. The air force, however, has accounted for more than 80 percent of Rand's earnings in the past few years and all of Rand's earnings in earlier years. In 1948 Rand earned about \$3.5 million. By 1962 Rand was earning about \$20 million and had spawned two subsidiary nonprofit organizations, Analytic Services, Inc. (Anser), earning more than \$1 million a year, and Systems Development Corporation (SDC), earning more than \$50 million a year. Rand, like all nonprofit research organizations working on defense contracts, reinvests the "profits" for independent research and new equipment.

Rand created Anser at the request of the air force, to do the detail work with which Rand did not want to bother. Systems Development Corporation, which did the studies of actual hardware needs of the air force, began as a division of Rand. It soon became apparent that SDC's work was going to make it much larger than Rand. Rand decided to let its child out of the house for fear the offspring would control the parent.

Since Rand, Anser, and SDC are not stock companies, Rand cannot control Anser or SDC through stock holdings. However, J. R. Goldstein, a Rand vice president, attorney Huddleson, and David Packard, a business partner with Rand trustee Hewlett in the Hewlett-Packard Company, are among those on the board of SDC. Collbohm, Goldstein, and Huddleson incorporated SDC in California, and it makes its main offices in Santa Monica. Anser, also incorporated in California by Collbohm, Huddleson, and Rand treasurer J. S. King, Jr., includes the latter two and Rand vice president Henderson on its board. In the event of the dissolution of SDC or Anser, the assets revert to Rand.

There is little doubt that much of Rand's original influence was generated by its close association with the air force, government, and industry. But, paradoxically, its greatest influence and its reputation as the innovator of strategic thinking have come because of its stubborn independence from the air force, government, and industry. This independence rests, of course, with the people who have come to Rand and the work they have done, sometimes in spite of the efforts of

Rand's administrators, to maintain harmony with the air force, government, and industry.

The Rand Corporation began in 1948 with a base of about 255 people — young Ph.D.'s with new ideas, and older scientists who had become intellectual or industrial gadflies. They were recruited quietly and slowly, through a scouting system, from the science and university centers of the West Coast and the Northeast. Today, recruiting in much the same way, Rand has nearly 1100 employees, of whom about 730 are researchers, almost all holding a Ph.D.

AT FIRST Rand was divided into four research departments. Now there are eleven: aero-astronautics, computer sciences, cost analysis, economics, electronics, logistics, mathematics, physics, planetary sciences, social sciences, and systems operations. Even the detractors of Rand, like Harvard's social scientist David Riesman, admit that Rand succeeded in bringing disciplines together in a working relationship as no university in the country has. "Rand has succeeded where universities have failed," says Riesman. "They have learned how to mobilize various disciplines, seemingly unrelated, to move with a problem from the seedling of theory to application."

One of Rand's distinguished alumni, Harvard professor Thomas C. Schelling, an economist turned strategist, calls Rand the perfect place for an intellectual prima donna. "University professors go to Rand because the salaries are good, the climate is ideal, there is much prestige in the job, and they can think and write without the nuisance of having to teach." Some go there for another reason, one which is beginning to influence many aspiring scholars — the desire to take part in power and policy making. "Rand is an ivory tower that is part of the real world," says Schelling. "You're part of a researching community, but you know your work is going to have an effect on things that are happening in the world."

Schelling gained his reputation through Rand, and so did men like Albert J. Wohlstetter, a logician who made a fortune building prefabricated houses; Herman Kahn, an intellectual iconoclast with a crackling-fast brain; Bernard Brodie, a grandfatherly political scientist from Yale who now gives learned lectures on "the residual possibility of general nuclear war"; Hans Speier, an historical sociologist famous for his studies of Nazi propaganda techniques; Charles Hitch, an economist, former Rhodes Scholar, and the author of a book which revolutionized defense policies; and Dr. Alain C. Enthoven, a brilliant,

eclectic economist who came to Rand at age twenty-six with a new doctorate and now, at thirty-two, holds a top job under Hitch, helping to apply economic principles to strategy in the Department of Defense.

RAND is not monolithic, however, and should not be judged by a few thinkers. Hundreds of researchers have contributed to the quiet work of Rand. Until the mid-1950s Rand was doing a competent, sometimes spectacular job of providing the air force with reasons and workable ideas for hardware and new weapons systems, and the strategic rationalizations for weapons for which the air force was seeking appropriations. An air force spokesman said one of Rand's "oblique" accomplishments was to give "prestige type support for favored Air Force proposals to the Department of Defense and the Congress."

In-flight refueling was a Rand innovation which gave the Strategic Air Command its global capability. Rand scientists, like Richard and A. L. Latter, helped solve theoretical problems in the design of the hydrogen bomb. This work to create the relatively light H-bomb led to proposals for an intercontinental ballistic missile. Rand scientists largely solved the heat and re-entry problems, and thus made the ICBM a reality.

But for Rand the air force might not have "naturally" come by the hegemony it has over intercontinental missile weaponry; the army and navy research programs were left far behind. Rand established offices in Washington under Henderson, where a large staff keeps in constant liaison with the Pentagon, and in Dayton, Ohio, near Wright-Patterson Air Base. After scoffing for some years at the Rand boondoggle, the other services resurrected their stagnant research programs and established their research organizations — the army's Research Analysis Corporation at Bethesda, Maryland, and the navy's Institute for Naval Analysis at Franklin Institute of Pennsylvania. The Defense Department established its Institute for Defense Analysis.

Rand's most far-reaching contribution, in research which affected long-range policies of the entire Defense Department, exerted great influence on political leaders, but parted with short-range air force interests.

In the late 1950s, when the ICBM was becoming a reality, Albert Wohlstetter headed a Rand study of strategic air force bases scattered throughout the United States and around the world. Wohlstetter concluded very quickly, to SAC's horror, that if the Russians struck first with a surprise attack, American air bases, many of them close to the Soviet Union, would be obliterated and the

planes would never leave the ground. Asking the question, "What would happen if the Russians struck at this moment?", Wohlstetter was forced to conclude we would lose a war in a matter of hours. Therefore, Wohlstetter said, our deterrent was no deterrent at all, and in view of our vulnerability we were not a retaliatory power but a first-strike power, and, therefore, we were giving the Russians good reason to surprise our forces.

In 1957, a committee headed by Rand board chairman Gaither made a report to the National Security Council on the state of American defense; and the same year the Soviet Union proved it had a workable ICBM when it orbited Sputnik. The Gaither Report, details of which remain secret, demolished the defense strategy of massive retaliation by pointing out that, with an effective ICBM which could reach to any part of the United States, the Soviet Union could destroy SAC bases and soft missile sites, and thus America's ability to retaliate. Our deterrent threat to retaliate was empty. Following the logic of deterrence, the United States was *not* a retaliatory or second-strike power, since we would have no second strike once the Russians hit us. Therefore the United States had, by its weakness, been thrust into the position of having become a first-strike power, of having to think seriously of making a pre-emptive attack on the Soviet Union. Worse than that, the Soviets were given good reason to make a surprise pre-emptive attack on the United States at any moment. One former Rand researcher reported at the time that Rand had come to be so sure of its logic that it was gloomily predicting the imminence of a Soviet surprise attack.

Wohlstetter, still worrying about the problem of vulnerability versus invulnerability, saw the coming world situation as a "delicate balance of terror." He suggested that if both sides achieved weapons which were immune to attack, then each side would have an "invulnerable second strike force." In that event neither side would want to attack the other for fear of being obliterated by the retaliatory blow. Wohlstetter felt this would bring stability to the cold war. This line of reasoning was one facet of systems analysis, the Rand brand of thinking that has had so much influence on the present Administration and on McNamara.

There was another strand of systems analysis which came largely from the economics department of Rand, headed by Charles Hitch, now Defense Department comptroller. It was called "cost effectiveness," and it applied traditional input-output methods of economics to defense weaponry and then to strategy. One of McNamara's "wizards of odds," Deputy Assistant Secretary of Defense Enthoven, worked at Rand under Hitch and Wohlstetter. Now in charge of systems

analysis for Hitch's office, Enthoven explains it this way: "The problem was how to allocate economic and strategic resources most effectively in a world situation where strategies must change with changing conditions. We have a given amount of resources. What is the best weapons system in which to invest these resources? We have a given world situation with limited political 'resources.' What is the best strategy to invest in this situation?"

Under the leadership of the logician Wohlstetter and the economists headed by Hitch and Enthoven, Rand sought to quantify strategic problems, the better to deal with them; to quantify the effectiveness of American striking strength, the better to know what we need; to quantify even uncertainties, the better to be prepared for all possibilities. The Rand strategists categorically deny that they use computers to give the United States its strategy, but they attempt as far as possible to attain the same level of superhuman machine rationality.

The kind of superrational quantitative analysis being applied to strategy and nuclear war in the Defense Department is shown by this excerpt from a recent Enthoven speech: "By 1961, a great deal of progress had been made in the development of an economic theory for our posture for thermonuclear war. . . . Although there is obviously much more to the problem of thermonuclear war than economic analysis of efficient and inefficient postures . . . we have made a great deal of progress in the translation of our broad objectives into specific quantitative criteria that can be applied in a systematic and practical way to the evaluation of proposed forces and postures. . . . The economic theory of our posture for nuclear war can be described in terms very similar to the economic theory of a multi-product firm."

Following the precepts of Wohlstetter and the systems analysts, McNamara built his Defense Department revolution around "controlled response," or the "controlled use of force," applying — in economic terms — an input of force to obtain the best possible output of results. This was cost effectiveness in strategy. Cost effectiveness in weapons procurement soon had the services howling at McNamara and Rand. With the building of Minuteman, McNamara saw no need for producing more manned bombers. If the navy had Polaris, there was no need for more expensive and more vulnerable aircraft carriers. It had to follow that the day of the big manned bomber and the big carrier was coming to an end. McNamara's application of systems analysis and cost effectiveness brought the cancellation of Skybolt, the end of the RS-70 bomber program, and it may bring the end of Dyna-Soar. In McNamara's view, they were unnecessary for our strategy.

As contract-renewal time came around, the air force made threats about cutting down Rand's funds. A Defense Department official who came from Rand says many on the Rand staff were in favor of looking elsewhere for contracts. Others felt they ought to remain working for the air force. The Rand administrators promised to curb some of the more independent and anti-air-force thinkers at Rand. Rand vice president Henderson, based in Washington, obviously annoyed by the strained air force-Rand relations, partly blames top Rand men who went to work for McNamara. He says he can sympathize with the air force criticism that Rand men are "end running" to the Secretary of Defense to sell their positions or realize ambitions for a glamorous Washington job. "We watch carefully to see that the Rand researcher doesn't do too much consulting at the Defense Department," Henderson said. "I don't think a man can do his proper research job for the Air Force if he's constantly at the Pentagon trying to sell his proposals."

As the Rand front office sought to satisfy some of the air force complaints, Rand personnel began to resign. One long-time Rand worker is now at M.I.T. Herman Kahn formed his own research unit, the Hudson Institute in New York.

It is debatable whether Rand consciously undermined the air force position in the American defense establishment, or whether the logic of strategic thinking in a thermonuclear world led Rand into an unavoidable and unwanted conflict with its biggest customer. But premeditated or not, once the battle was joined, Rand thinkers used their elaborately gained skills in strategy to go over the head of the air force to the Department of Defense, or woo young junior officers to their position in an attempt to isolate the bluff and blunt top brass, who did not take kindly to professorial planning of a war.

RAND has helped revolutionize strategy and put the war-making power and the military under civilian authority; it has also had more intangible but nonetheless disturbing, contradictory, and far-reaching influences elsewhere. The Rand strategy, Harvard political scientist Henry Kissinger says, may lead to the breakup of any effective NATO alliance. McNamara's downgrading of thermonuclear threats and tactical nuclear capability in Europe has given impetus to France's desire to acquire its own deterrent threat with an independent nuclear force. Somehow, McNamara's staff of human computers cannot understand France's reluctance to place its nation's most vital interests in systems analysis.

"I have a great deal of respect for the intellectual contribution of Rand in bringing systematic and sophisticated study to strategic problems," Kissinger said. "But there is a fantastic intellectual arrogance for all traditional forms and all those facets of human beings and nations which are not rational. As a result there is a terrible lack of knowledge of men as they are in the real world. Rand looks upon general war and foreign policy from a point of view of cost effectiveness and efficient management. They would have Europeans fit into this scheme, but Europeans do not see themselves as men on the Rand chessboard. They know there is more to men than systems analysis."

More immediate, however, has been Rand's effect on American higher education. As Rand and other nonprofit research groups raided campuses to lure the best minds, many colleges and universities sponsored nonprofit institutions on or near their educational plants to take on various jobs in defense research and hold on to eminent scholars. The Bell Committee report on government contractors for research and development said, "Well over half of the research budgets of such universities as Harvard, Brown, Columbia, Massachusetts Institute of Technology, Stanford, California Institute of Technology, University of Illinois, New York University, and Princeton, for illustration, is supported by Federal funds." Many colleges, the report went on to say, have established research organizations related to but separated from the universities, to vie for government research and development contracts. At M.I.T. two such facilities, Lincoln Laboratories and Instrumentation Laboratories, have operating budgets which, when combined, are more than twice the total budget of M.I.T.

Harvard President Nathan Pusey indicated the uneasiness in the minds of many educators when he reported to the university's faculties and governing board in 1961 that, "At least 80 per cent of the institutions of higher education in the United States now receive federal funds, and Harvard is one of those heavily involved in federal programs. Federal research programs make it all the more difficult to preserve the proper balance among various schools and departments, or within each of them between research and teaching. There is danger that the total program of the university could be affected."

Congressmen have been bothered by the effects the nonprofit research organizations are having on industry. California Representative Chet Holifield, chairman of the military operations subcommittee, which has been keeping track of government-sponsored research and development, has expressed alarm that private industry has been enriching itself through the taxpayer-financed

work of nonprofit corporations. He argued in Congress for an amendment to the defense appropriations bill which would protect, for the government, the patents on discoveries made by nonprofit research organizations. In the debate over the amendment Holifield wanted to know "whether the Defense Department is going to continue to give away windfall patent benefits to its contractors which have been paid for by money of American taxpayers." The amendment was defeated.

Industry spokesmen frankly admit that new weapons and hardware devised by nonprofit companies like Rand have helped in their non-government business. Arthur Raymond of Douglas Aircraft says his company could not have built the DC-8 without government-sponsored research on swept-wing bombers. The Boeing 707 virtually duplicates the government-financed designs for the jet tankers now in use. As the government puts more and more money into defense research, private industry decreases the amount of money it spends on research for nondefense products.

CONTROLS over research and development programs, such as those recommended by the Bell Report, by Congress, and by educators, can ameliorate the deleterious effects of Rand and its kin in the areas of government, business, and education. Problems like conflict of interest and empire building are being watched by the responsible people in government, in education, and in the scientific community. Yet the most disturbing influence emanating from Rand and other organizations of its type is less tangible, for it affects ordinary people, most of whom think Rand makes typewriters, and have become resigned to the cold war and the billions spent each year.

Roger Hagan, a Harvard historian and a contributor to the *Bulletin of the Atomic Scientists*, believes Rand has "increased public acceptance of nuclear war as a part of national policy. Rand thinking has always been negative in presupposing an eternal, ever spiraling conflict between the United States and the Soviet Union. Rand has done nothing to exert effort in thinking about reasons, alternatives and the way to end thermonuclear confrontation."

The little research Rand has done on disarmament or toward reaching an understanding with the Soviet Union has, in fact, been negative. Rand researchers, for example, have devised the presently used "Command and Control" systems to help prevent the accidental outbreak of war. They have analyzed disarmament proceedings to show why negotiations will probably continue to be fruitless. They have studied nuclear-test-ban

proposals, but always with an eye to show the flaws. Once Rand issued a scholarly report entitled "Strategic Surrender" and suppressed it because of a congressional outcry.

Rand has done little positive research toward ending nuclear confrontation because of the belief of Rand's leading thinkers that the theory of "mutual invulnerability" is a positive way to peace. Its research, therefore, is founded on the ability of the United States and the Soviet Union each to maintain power enough to discourage the other from starting a war. Mutual invulnerability, however, is a foundation built upon the sand of an interminable cold war and an onward and upward arms race.

Once we had to have only enough weapons to render the Soviet Union a "massive and crushing blow" should it ever decide to attack the United States. Now, both sides are protecting their missile forces by putting them in submarines or in concrete underground silos. The Rand strategist has thus invented the words "overkill" and "megadeath" to work out in computer fashion the even greater potential destructive force which the United States must have in order to win a nuclear duel. In short, an overkill capacity is needed because a kill capacity will not suffice. Because the "winning" of such an exchange would be meaningless if the civilian population perished, Rand strategists call for a massive shelter program. Yet, paradoxically, if the United States or the Soviet Union was to embark upon mass shelter programs, each side would be tempted to assume that the other was preparing for attack.

In 1957, when the Russians launched the first Sputnik, Rand predicted the Soviet Union would embark on a crash ICBM program which would leave the United States on the short end of an intercontinental missile gap by 1961. As a result the United States began a crash ICBM program. As it developed, the Russians did not increase production of their ICBM until 1961, when it became evident to them that the United States had an overwhelming superiority. The Rand prediction, wrong, as it turned out, precipitated another round of the arms race.

Now limitless space beckons to the strategist for what may become a new round of the struggle for mutual invulnerability. Almost resigned to the loss of the prestigious manned bomber, the air force has opened its campaign for the military exploitation of space. The *Air Force and Space*

Digest, a publication of air force supporters, has taken the offensive against McNamara for dropping the Skybolt and the B-70 bomber program, while it has simultaneously demanded for the air force a greater role in space. The air force, an old hand in the art of interservice rivalry, has been quietly exerting pressure to build up its own potential for space exploration while denigrating the role of civilian-controlled NASA. Rand strategists and researchers have been at work devising weapons systems for space and constructing the rationale. The Russians, they say, are already at work attempting to use earth-orbiting satellites as launching pads for nuclear missiles. Therefore, the Rand researchers believe, it is only a matter of time before the Soviets accomplish this. To maintain mutual invulnerability it is thus necessary that the United States immediately begin a program to exploit space for military purposes.

Largely because of the influence of Rand, the United States now has a rationale for an interminable cold war. Rand's new mode of thinking has led fascinated scholars to the theory of games in warfare and the "rationality of the irrational." Studied seriously, for example, is the prospect of taking certain strategic decisions out of the hands of statesmen and putting them into computers whose course could not be changed. Thus, if we give the computer a set of instructions to "push the button" under certain circumstances, any enemy will surely be deterred, since the possibility of turning back from war will be out of our hands. And so the rationality of Rand becomes a closed rational system which negates humanity and takes an exclusively intellectualist world view.

It is clear that the cold war has become a Frankenstein monster which toys precariously with the weapons for the world's obliteration. And until now, political leaders, military minds, strategists, scientists, and scholars have labored to keep the monster leashed, lest it bring doom to hundreds of millions of people.

The thousands of scientists and scholars influenced by Rand have given powerful demonstrations of their ability to create. But do they step back from the fascinating process of creation to see what it is they have wrought? Can these thinkers who have given of their talents seek the way to stop the mechanism and the will of the monster? Or must we hang on to its leash as it pulls us now across the threshold of infinity into space?